

## CLAIMS:

1. A method of forming a reader of a magnetic head, the method comprising:
  - forming a sensor with an air bearing surface;
  - forming a hard mask on the sensor extending from the air bearing surface a distance substantially equal to a desired stripe height of the sensor; and
  - removing a portion of the sensor not covered by the hard mask.
2. The method of claim 1, wherein forming a hard mask comprises:
  - forming a hard mask over an entire top surface of the sensor;
  - patterning a photoresist mask on a first portion of the hard mask; and
  - removing a second portion of the hard mask not covered by the photoresist mask.
3. The method of claim 1, further comprising thinning the hard mask during the removal of the portion of the sensor not covered by the hard mask.
4. The method of claim 1, further comprising forming a first half gap prior to the formation of the sensor such that the sensor is formed above the first half gap.
5. The method of claim 3, further comprising forming a second half gap over the thinned hard mask.
6. The method of claim 5, further comprising forming the second half gap over a back edge of the sensor.

7. The method of claim 1, wherein forming a sensor comprises forming a giant magnetoresistive sensor.
8. The method of claim 1, wherein removing the portion of the sensor not covered by the hard mask further comprises forming a steep back edge on the sensor.
9. The method of claim 1, wherein removing the portion of the sensor not covered by the hard mask further comprises steep dry etching the portion of the sensor not covered by the hard mask.
10. The method of claim 1, wherein forming a hard mask comprises forming a hard mask of an insulating material.
11. The method of claim 1, wherein forming a hard mask comprises forming a hard mask of aluminum nitride.
12. The method of claim 1, wherein forming a hard mask comprises forming a hard mask of aluminum oxide.
13. The reader of the magnetic head formed according to the process of claim 1.
14. A method of forming a reader of a magnetic head, the method comprising:
  - forming a sensor with a first portion and a second portion;
  - forming a hard mask on the sensor having a first portion and a second portion;

forming a photoresist mask on the first portion of the hard mask;  
etching away the second portion of the hard mask not covered by  
the photoresist mask;  
removing the photoresist mask to expose the first portion of the  
hard mask; and  
dry etching the first portion of the hard mask and the second portion  
of the sensor to remove the second portion of the sensor to  
define a desired stripe height of the sensor and a steep back  
edge of the sensor.

15. A method of forming a reader of a magnetic head, the method comprising:

forming a first half gap;  
forming the reader on the first half gap;  
forming a hard mask on the reader;  
patterning a photoresist mask on a first portion of the hard mask;  
removing a portion of the hard mask not covered by the photoresist  
mask;  
removing the photoresist mask;  
removing a portion of the reader not covered by the hard mask to  
form a back edge of the reader;  
forming a second half gap over the hard mask, adjacent the back  
edge of the reader, and over a portion of first half gap not  
covered by the reader.

16. The method of claim 15, wherein removing a portion of the reader not covered by the hard mask comprises end point steep dry etching a portion of the reader not covered by the hard mask.